

Peritrichous flagella of *Thiovulum majus*

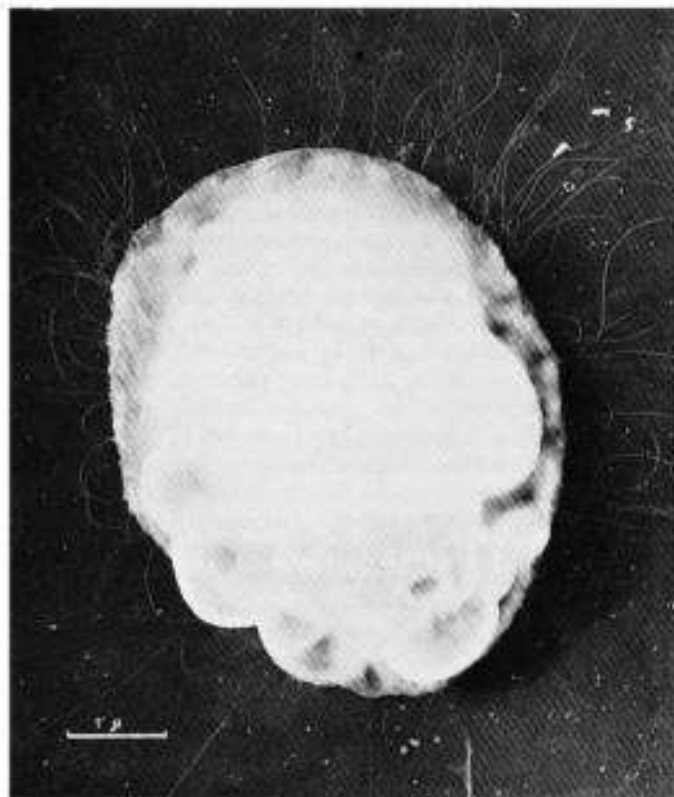


Fig. 1. Electron micrograph of *Thiovulum majus* showing flagella.

Properties

- Spherical shape
- Radius 5-25 μm
- Velocity 250 (150-600) $\mu\text{m/s}$
- Helical tracks

R.Thar,T.Fenchel, Appl.Env.Microbiol.,71,3682 (2005)

TABLE 2. Compared parameters of microbial swimming

Organisms	U^* (μm s^{-1})	B/s^*	F_{v}^* (10^{-10} dyn)	Source or reference
Procaryotes				
<i>Pseudomonas aeruginosa</i>	55	37	8	11
<i>Chromatium okenii</i>	45	5	43	11
<i>Thiospirillum jenense</i>	86	2	285	11
<i>Escherichia coli</i>	16	8	3	11
<i>Bacillus licheniformis</i>	21	7	6	11
<i>Sarcina ureae</i>	28	7	11	11
<i>Vibrio comma</i>	200	50	38	9
<i>Thiovulum majus</i>	600	40	1,696	This work

F.Garcia-Pichel, J.Bact., 171, 3560 (1989)

← W. De Boer, J. La Rivière, and A. Houwink, *Antonie van Leeuwenhoek* 27, 447 (1961).

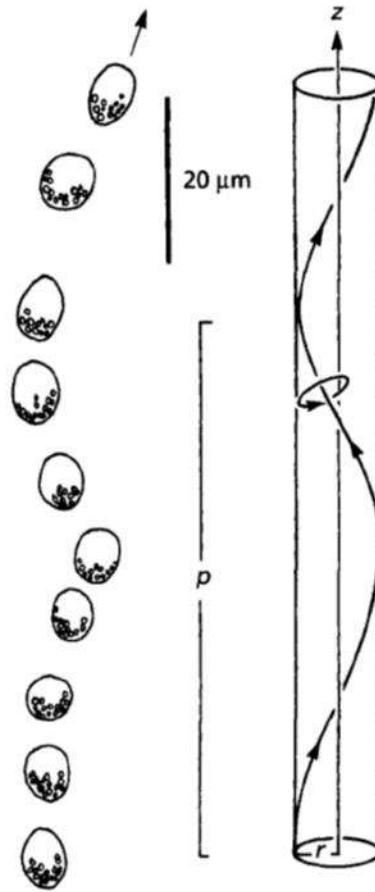


Fig. 2. Right: Properties of (left-handed) helical swimming: pitch (p), radius (r) and tangential and rotational velocity components. Left: Swimming track in the optimum zone of a *Thiovulum* cell recorded under the compound microscope. Time intervals: 40 ms. In this particular track the tangential velocity was $330 \mu\text{m s}^{-1}$, r was $5 \mu\text{m}$, p was $65 \mu\text{m}$, and the period T was 0.24 s . The swimming velocity in the z -direction was $p/T = 271 \mu\text{m s}^{-1}$.

Angular velocity

$$T = p / v \cong 0.24 \text{ s}$$

$$\Omega = 2\pi / T \cong 26 \text{ s}^{-1}$$

Fig.2

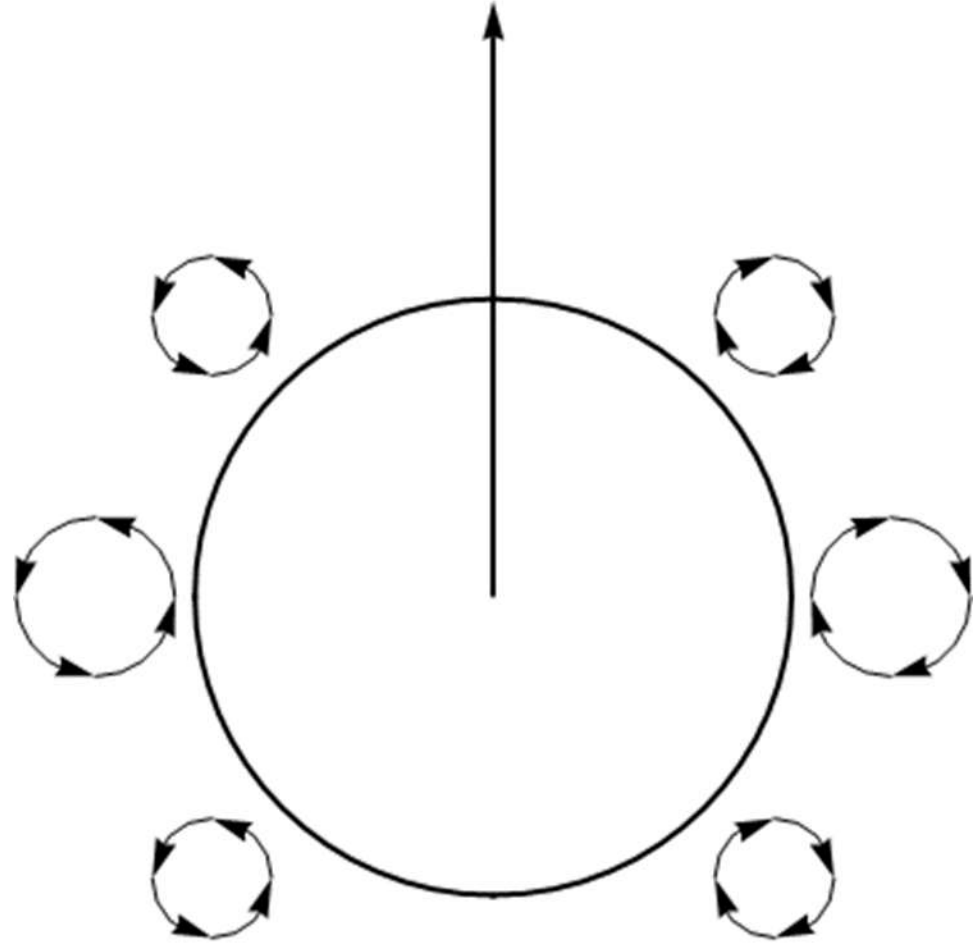


Fig.3

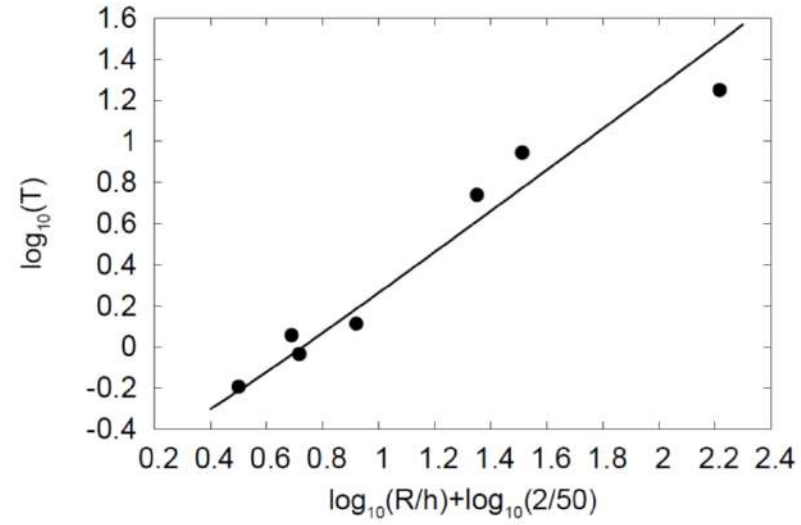
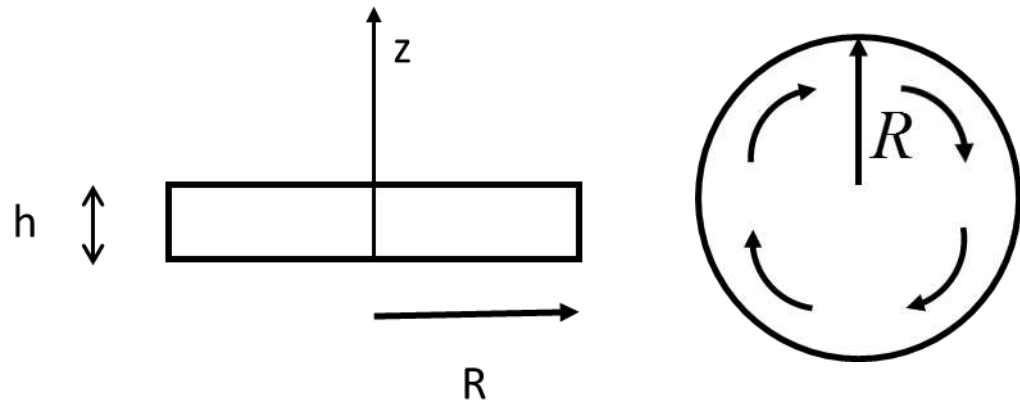
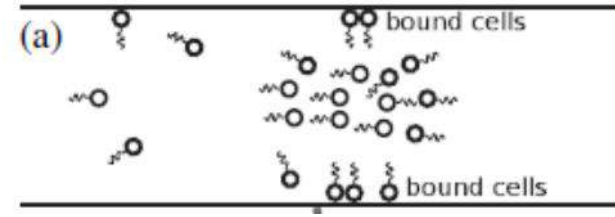
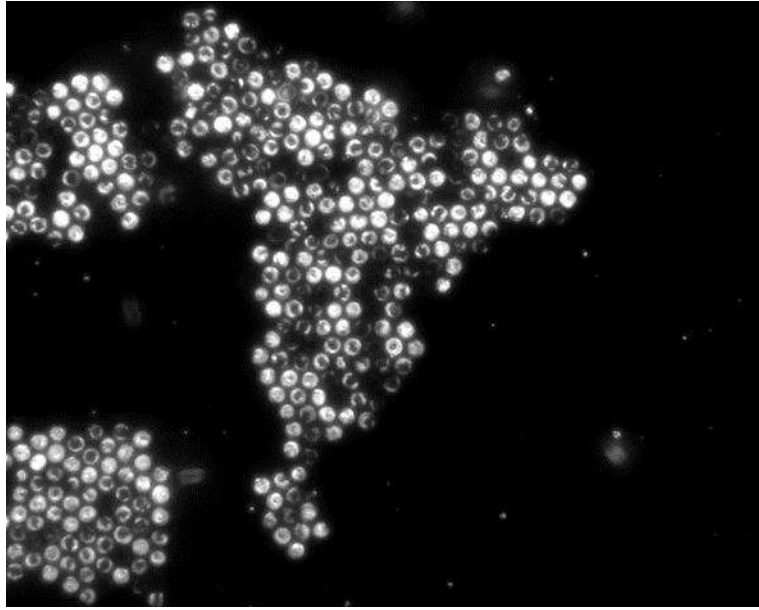


FIG. 2: Period of the crystal rotation T (in seconds) as a function of its size. $4\pi\eta/(n\alpha\Omega_0) = 2/50$ s.

Fig.4